

THE **e**LEARNING DEVELOPERS' JOURNAL

Strategies and Techniques for Designers, Developers, and Managers of eLearning

THIS WEEK — MANAGEMENT TECHNIQUES

e-Learning Process Improvement: How's Your Content Production Working?

BY BILL BRANDON

In e-Learning today, we are all under pressure to improve speed, productivity, and cost efficiency. Frequently, we respond to these pressures by looking at modifications to our current processes rather than asking whether the process we are using is fundamentally correct and adequately supported.

The content collection and materials production processes are the least understood, least often addressed, and least studied elements of e-Learning creation. This is unfortunate. As a result,

e-Learning production can be a chaotic affair in many organizations. (See Figure 1 on page 2 for one view of a worst case process.)

Experienced e-Learning managers, designers, and developers appreciate just how much time, cost, and effort are associated with content collection and materials production. Typically, problems arise when:

- Employees, users, and customers are not involved, other than coincidentally, in the definitive steps of the process
- Designers fail to connect their work to the larger business issues
- Much of the content input comes from individual subject matter experts, who

may not see the big picture

- Critical content comes to the design team in a variety of forms: digital and analog, structured and unstructured
- Because of this diversity, unstructured and analog content gets lost, digital content is not searchable through one common interface, and there is no common repository or index for the content that has been collected
- Analysis and organization of the collected content and conversion from analog to digital form are tasks left to the design team

These weaknesses add to the risk associated with instructional development projects. Fortunately, they are busi-

In e-Learning, we place a great amount of attention on the design process, and far less attention on the production processes. While design is required to solve performance problems, it's the production process where the rubber meets the road. Here's a fresh look at production, with an eye toward process engineering, and with a list of resources that may help you deliver better e-Learning faster and at lower cost.

THE **e**LEARNING DEVELOPERS' JOURNAL.

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As in any profession, there are many different perspectives about the best strategies, techniques and tools one can employ to accomplish a specific objective. This **Journal** will share different perspectives and does not position any one as "the right way," but rather we position each article as "one of the right ways" for accomplishing a goal. We assume that readers will evaluate the merits of each article and use the ideas they contain in a manner appropriate for their specific situation.

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ness process issues, and as such they can be addressed by taking a fresh look at the production process.

In this article, I offer two related approaches to process improvement in the content collection phase of e-Learning production. No matter how excellent the design process, content collection is the critical step in development. Content collection is the transformation into consistent formats of individual knowledge and expertise, organizational goals, existing online and offline information and materials, and relevant but unstructured information from the world at large. Any steps taken to improve the business process for that phase will improve the result. In addition, the availability of tools and infrastructure to support content collection, to facilitate communication among stakeholders, and to regulate the information flow into structured digital content from the very beginning of the process will save time and reduce risk.

Design versus production

In its purest form, design is about determining the strategies and tactics required to solve a specific problem, arranging these in an effective sequence, and establishing the most appropriate way to evaluate the success of the solution. Production is about execution to the plan developed in the design phase. The production phase must allow flexibility for iteration and evolution.

Each of these phases is dependent on the other. A beautiful design without a production process to support it is only wishful thinking. A production effort without a design to guide it is a nightmare. At the same time, even though both phases exist within a single business process (e-Learning), it is essential to understand the unique nature of each.

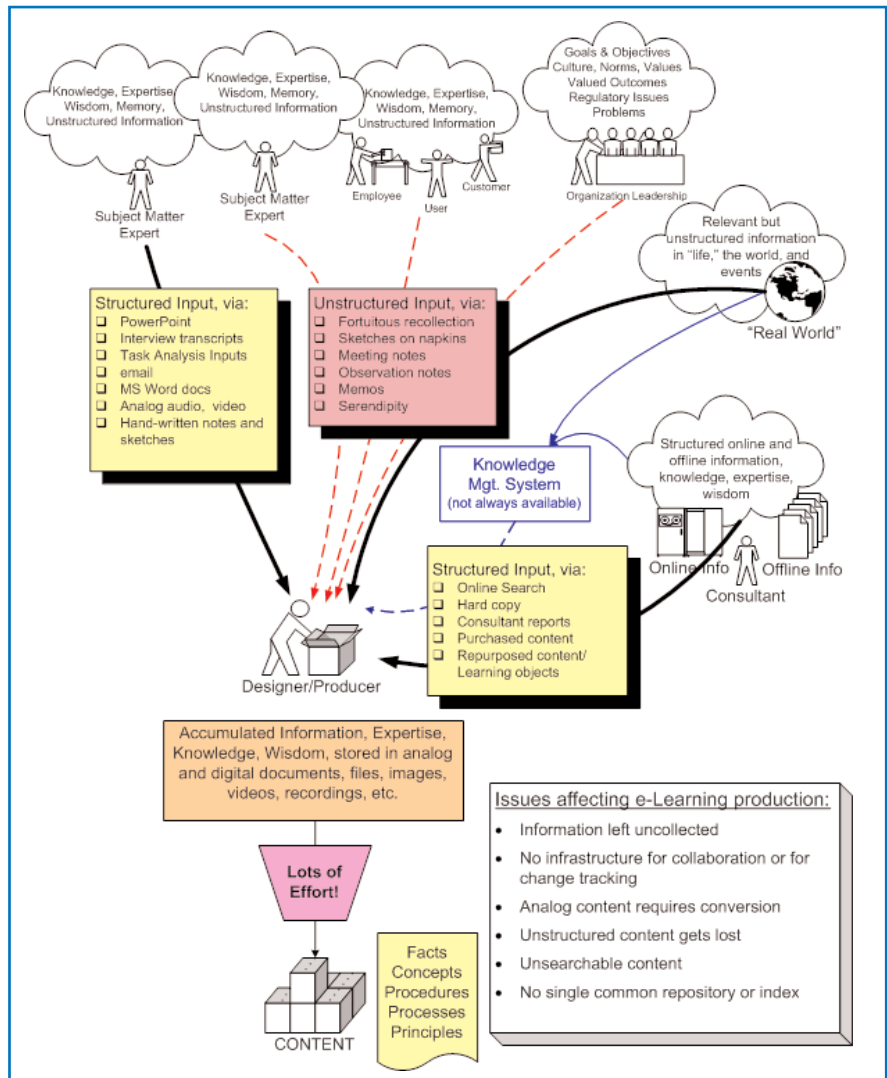


Figure 1 A typical e-Learning content development process

The design process

Within each of the major paradigms or models for learning and for instructional design (behaviorism, cognitivism, and constructivism), there are dozens if not hundreds of algorithms (methods) for accomplishing learning objectives. A major function of the design process is to determine the choice of algorithms.

Among the several competing design models, the one that most e-Learning professionals are familiar with is referred to as "ADDIE" (Analysis-Design-Development-Implementation-Evaluation). ADDIE applies the systems approach to instructional design. The systems approach is a problem-solving method which offers a series of steps to:

1. Define the problem as clearly as possible
2. Analyze the problem and identify alternative solutions
3. Select from the alternatives and develop the most viable solution mix
4. Implement and test the solution
5. Evaluate the effectiveness and worth of the solution

These steps are fine for design purposes (when they are actually and correctly carried out — often not the case), but they're not sufficient guidelines for production. Steps three and four, for example, do not articulate the issues which our discussions of rapid e-Learning revolve around, our connection to business outcomes, our concerns over authoring tool selection, the endless questions about LMS and LCMS use, and many of the debates over effective use of graphics and audio, to name just

a few of the practical concerns that keep e-Learning producers awake at night. All of these are production issues.

The production process

The production process for e-Learning involves at least four elements, all aimed at execution of the design:

1. Content collection
2. Application production and packaging
3. Collaboration between experts and among the production team
4. Knowledge sharing and knowledge management

Associated with each of these steps is a large set of software and hardware, connected via network, that can facilitate the production process. (See Figure 2, below.) Many of these tools have applications beyond e-Learning. In many cases

organizations already own these tools, but have not applied them to e-Learning development. In other cases, the software or hardware is simply not familiar. And finally, especially in the case of hardware, recent improvements in capabilities make it possible to realize big gains in productivity at relatively low expense.

The tools in Figure 2 include those which will assist in creation of structured digital content by subject matter experts, designers and developers, and they include infrastructure applications to facilitate and manage collaboration and knowledge creation. Discussion of tools for e-Learning development often focuses only on the application production and packaging tools.

Content creation and selection tools tend to be chosen by default, as indicat-

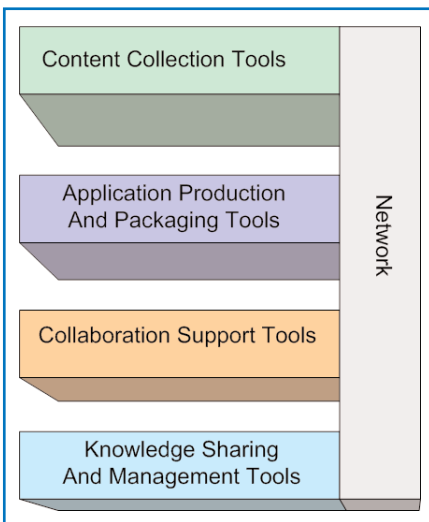


Figure 2 An application architecture for e-Learning production

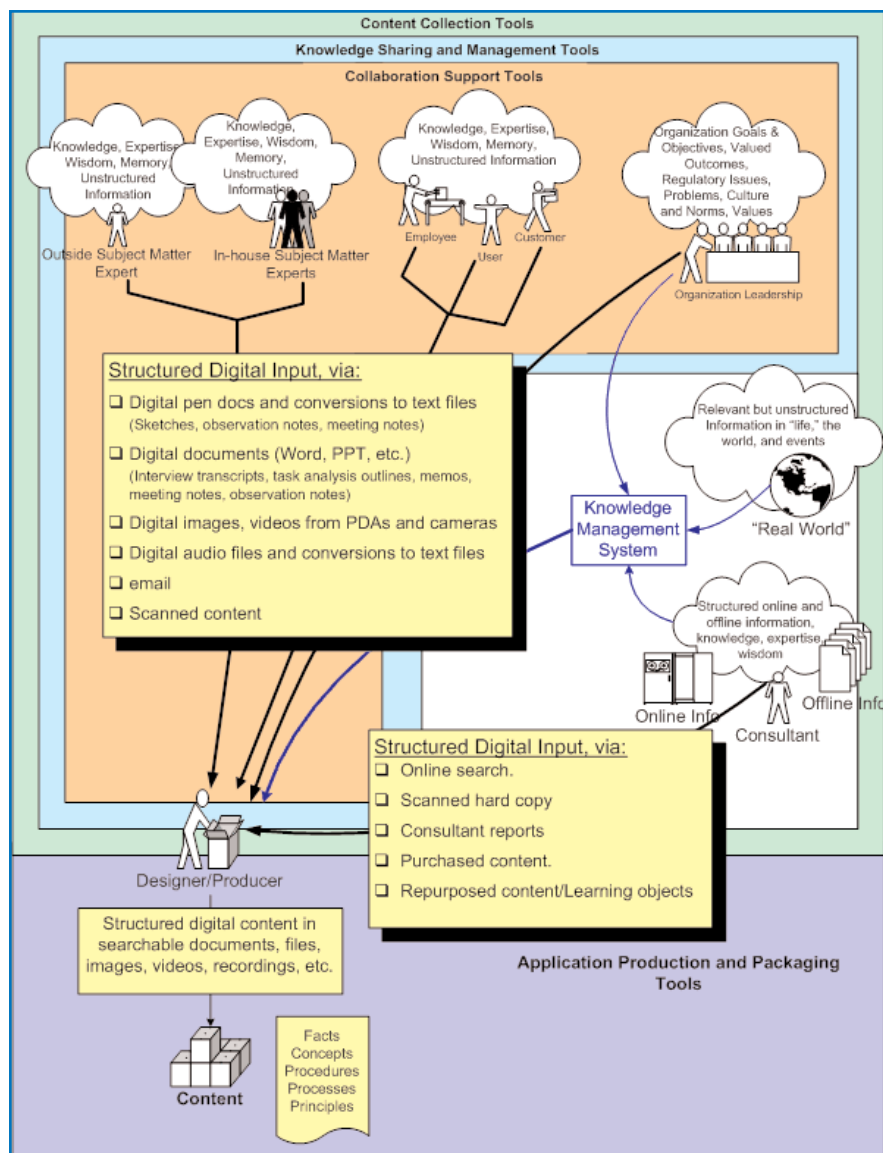


Figure 3 An idealized e-Learning content development process

ed in Figure 1 earlier. In other words, by default, subject matter experts develop their content input by using PowerPoint and Microsoft Word. By default, designers and developers tend to use analog tape recorders and handwritten notes as the basis for capturing expertise and knowledge during interviews, and then later transcribe this information into Microsoft Word. In addition, collection of input from secondary subject matter experts, from employees, from users, and from customers is often done through informal, handwritten notes. Other input may arrive in digital form from various sources, but the formats are rarely consistent with each other, or optimal for use by the design and development teams.

In an organization where the tools and infrastructure depicted in Figure 2 are

not available, content collection frequently results in information accumulated in a variety of digital and analog forms, including files, images, video, recordings, etcetera. By dint of a great deal of effort on the part of the design and production teams, this accumulation is transformed into instructional content: the facts, concepts, procedures, processes, and principles delivered to the learners.

A revised, supported content collection process

Figure 3 on page 3 presents an idealized view of the content collection process, correctly supported by an infrastructure that includes collaboration support and knowledge sharing and management tools. The process is also supported by content collection tools to provide structured digital input of sketches, notes,

transcripts, content outlines, email, still and video images and audio, and scanned content. Support for structured digital input from online search, purchased content, repurposed content and learning objects is maintained as before.

In addition to the infrastructure items, for full effectiveness the designer and production team should have access to a knowledge management system that will deliver structured digital content from the analog world. Such a knowledge management system need not represent an enormous financial investment for the organization.

The further intent of the idealized system in Figure 3 is to establish collaborative input from the in-house subject matter experts, together with regular and routine input from outside subject matter experts, from organization leadership, and from employees, users, and customers, within a single common collection system. To the extent that this system eliminates analog input, and to the extent that it reduces the variety of formats while improving communication between all parties, the system will reduce risk of failure, and lower the time and cost associated with e-Learning development.

As I noted earlier, some of these tools will be unfamiliar to readers, or the notion that they might be used in e-Learning production may be novel. Let's look at the tools in a bit more detail.

Tools to support the production process

Within this section, I'll introduce hardware and software that you may not have thought of in connection with e-Learning development and production. At the end of this section, I have included some specific suggestions for hardware and software. I've summarized the tools by category in Figure 4 to the left.

Content collection tools

These are the tools that subject matter experts, employees, users, and customers, as well as the design and development team, will use to create or document their knowledge, expertise, wisdom, memory, and unstructured information, as these relate to the problem solution outlined by the designers. I have identified five categories of hardware, and four related categories of software, plus the ubiquitous Microsoft Office applications, for discussion in this article. As time goes on, I am quite certain that new tool

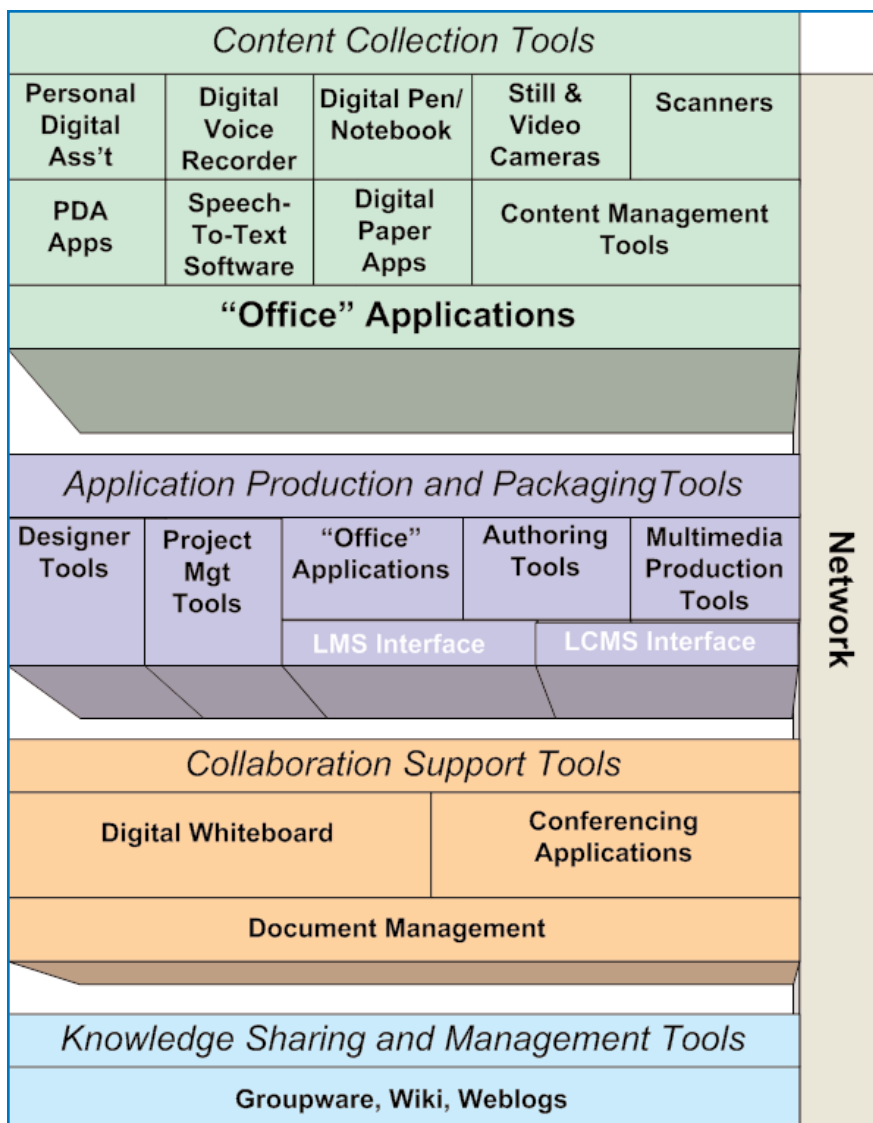


Figure 4 A detailed list of tools categories for content development

categories will appear.

Personal digital assistants

Most of us think of our PDAs (personal digital assistants) mainly as keepers of our agenda. However, new developments in the PDA category (especially for those PDAs running under the Palm OS) have added significant functionality that should be of interest to e-Learning developers and producers.

The latest PDAs (and not necessarily only the most expensive ones) can frequently function as a laptop substitute. This makes them ideal for field use during content collection. These PDAs run a variety of software, including much that is 100% Microsoft Office compatible. It is even possible now to create, edit and project a Microsoft PowerPoint presentation directly from a PDA; this can tremendously simplify, for example, brainstorming, collaborating on and “pitching” a storyboard for an e-Learning module. Other software applications available for PDAs include outliners and mind mapping.

The extended range of PDA features and applications of interest to me as an e-Learning producer include:

1. The ability to shoot still photos and lengthy videos of sufficient quality to support task analysis in the field, location scouting for video shoots, and graphic creation by artists;
2. The ability to record hours of digital audio during interviews and meetings, and to record dictation compatible with speech-to-text software.

Digital voice recorder and speech-to-text software

Digital voice recorders and speech-to-text software have a long and steadily improving history. My experience with these goes back six years, and I am now at the point where a great deal of my personal productivity depends on them. (In fact, this article was wholly dictated, both through a digital voice recorder and directly to Microsoft Word on my PC.) In general, I find that speech-to-text software now captures my dictation as well as a human transcriptionist did 20 years ago — about 95 to 100% correct on the first pass.

I use digital audio in two ways. First, I find it very useful for recording interviews. The improvement over analog tape recorders is that a digital voice recorder, even without a memory card, can often record up to 22 hours of interviews. This means that I no longer have to lug around and keep track of a bag

full of audiotapes. When the recorder’s memory is full, I can either upload the audio files to my desktop, or I can put in a new memory card (depending on the specific voice recorder). Second, digital voice recorders permit writing and dictation in “stolen moments” — times when I’m away from my desktop.

Digital paper, digital pens, and handwriting recognition

This is a category that may be unfamiliar to you. Rather than try to explain the technology, I’ve included some links in the references in Table 1 below. Essentially, you can now hand-write notes and sketches on real paper with a ballpoint pen while capturing them in digital form, upload and edit those notes on a desktop or laptop PC, make handwritten corrections on the original and track those changes on your PC, and convert the written notes into editable text.

Why would you want to do this? One obvious reason is that like the digital voice recorder and the PDA, digital pen and paper allows you to work away from your desk. In addition, many of us find that our ideas flow more easily when we can work them out on paper and in diagrams. This is a big improvement over notes made on cocktail napkins, restaurant tablecloths,

and the backs of envelopes.

Another reason to consider making the small investment required is the matter of distraction. The digital pen and paper is good for taking notes at meetings, since there’s no keyboard clatter to annoy other participants. A notebook and pen is less distracting to interview subjects than a laptop, and less threatening than a recording device.

Finally, if you are working over a long period with a subject matter expert or a group of subject matter experts, it may be worth considering providing them with their own digital pen and paper. This allows the experts to work with pen and paper — a medium in which they may be much more comfortable — and yet facilitate conversion of their input to structured digital form.

Digital still and video cameras

It may be simpler to use the camera function on your PDA if you have one. However, still and video cameras are sometimes needed for special situations (low light, magnification required, won’t get a second chance to shoot video, etc.). Again, the intent is to provide content in digital form directly to the production team, and so to eliminate conversion steps.

TABLE 1 Production support resources

| Category | Product | Comments | Web site |
|---|--|---|---|
| Content Collection | Palm Zire 72 PDA | Camera/Video Digital voice recorder SD memory card | http://www.palmone.com |
| | Useful software | DocumentsToGo (MS Word) | http://www.dataviz.com/documents |
| | | PresenterToGo (Powerpoint) | http://www.margi.com |
| | | ThoughtManager (Outliner) | http://www.handshigh.com |
| | | Inspiration (Mind Mapper) | http://www.inspiration.com |
| | | TealPaint (Storyboards, graphics) | http://www.tealpoint.com |
| | Olympus DS-2 Digital Voice Recorder | Compatible with Dragon Naturally Speaking and IBM ViaVoice | http://www.olympus.com http://www.scansoft.com/naturallyspeaking http://www.scansoft.com/ViaVoice |
| Anoto digital paper and compatible pens | Anoto owns the patent, others (listed on Web site) provide the products and software | http://www.anoto.com | |
| PaperPort Professional 10.0 | Content Management software | http://www.scansoft.com/paperport | |
| Collaboration Support | NextPage | Hosted document management | http://www.nextpage.com |
| | WorkShare | Document management | http://www.workshare.com |
| Knowledge sharing and management | Twiki | Wiki software for learning design and development, free, community supported | http://www.twiki.org |
| | The Brain EKS (Enterprise Knowledge System) | Flexible knowledge management for workgroups | http://www.thebrain.com |

Scanners and content management tools

This combination facilitates capturing unstructured analog content (text and graphics), and converting it to structured, indexed, searchable digital content. Most content management tools for use with scanners will also do basic optical character recognition (OCR). In many cases, production teams have this technology available, but never seem to think of ways to use it.

Application production and packaging tools

Since this is the area most commonly addressed by e-Learning writers, I have simply listed the categories in Figure 4. I include designer tools and project management tools in this category, recognizing the iterative nature of design and production in the real world. In addition, it is useful to select tools across these categories that "play well together." Looking at all of them on one diagram may help with this.

Collaboration support tools

Many design and development teams are already using conferencing tools. However, I find that most are not using digital whiteboards to support brainstorming and planning unless participants are scattered around the globe. For some reason, most of us think of digital whiteboards as a tool for the synchronous trainer, rather than for the designers and production team in collaboration with each other and with subject matter experts, employees, users, customers, and organizational leadership.

In addition, document management applications have made big strides in their capabilities. These systems are no longer restricted to the wealthiest organizations. New hosted document management software is lower in cost, and can easily accommodate participation by individuals outside of the organization. These hosted systems may not require payment of additional "seat fees" for outside users.

Knowledge sharing and management tools

This category includes old groupware standbys, such as Groove and IBM Lotus Notes. Many organizations are already using these applications if they have them. For smaller organizations, wikis are coming into increasing use. A wiki is a Web site where any user may add, edit, or delete any page. Obviously, there are support issues for IT in the adoption of wikis. However, many IT organizations are also finding wikis useful for software development. This may be a situation where both e-Learning and IT can gain valuable benefit from the same application.

In some cases, where wikis are not an acceptable solution, individual Weblogs can provide similar functionality.

Finally, a basic knowledge management tool can be invaluable to the production team, as well as to the larger organization. Generally, midsize organizations and larger should already be adopting this technology.

e-Learning for e-Learning Professionals...

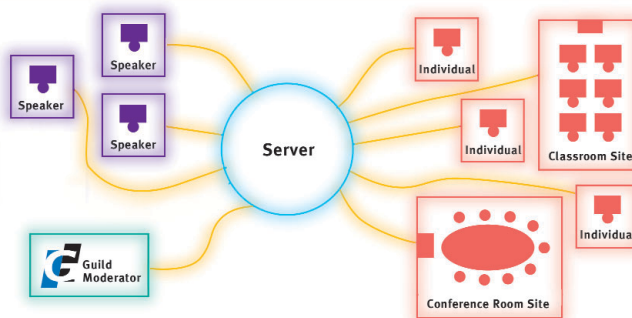
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MAY 12, 2005

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Conclusion


The design process and the production process are subordinate parts of the overall business process known as e-Learning. What we do as e-Learning producers has a great deal in common with traditional software projects, and I believe there is much that we can learn from best practices in that arena.

The traditional approaches to structure software projects always begin with the same three phases: define, design, and build. This linear description is much more concise, of course, than the actual iterative path involved in creating an interactive product. For summary purposes, though, I'm going to stick with it.

In the define phase, we assess needs, validate assumptions, and identify and articulate the strategic objectives and project requirements. The design phase results in a tactical plan to meet the strategic objectives, high-level design, and the learning architecture. In the build phase, the production team executes to the plan, developed in the design phase. The build phase must allow flexibility for iteration and evolution.

Many of the reasons that e-Learning projects fail are tied to issues in the define-design-build sequence. Key among these are:

1. Problems with internal communication between stakeholders
2. Key elements not integrated into process
3. Scope creep
4. Different expectations among stakeholders

I believe that all of these problems, and more, can be effectively eliminated by reengineering our business processes so that they have adequate infrastructure support for collaboration and knowledge sharing as well as for content collection and for application production and packaging. I also believe that it is vital to systematically select software in these categories so that designers and producers need only deal with structured digital input, rather than the mixture of structured and unstructured, analog and digital content as they must presently. 

Author contact

Bill Brandon is the editor of the eLearning Developers' Journal. Send your comments on this article to him by e-mail at bbrandon@eLearningGuild.com.

Additional information on the topics covered in this article is also listed in the Guild Resource Directory.

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- **A draft of the first paragraph**, written to grab the reader's attention and identify the problem or issue that will be addressed.
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Through this member-driven community of designers, developers, and managers of e-Learning, the Guild provides high-quality learning opportunities, networking services, resources, and publications.

Guild members represent a diverse group of instructional designers, content developers, web developers, project managers, contractors, consultants, managers and directors of training and learning services – all of whom share a common interest in e-Learning design, development, and management. Members work for organizations in the corporate, government, academic, and K-12 sectors. They also are employees of e-Learning product and service providers, consultants, students, and self-employed professionals.

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